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The prognostic efficiency of DSM-III in schizophrenia

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THE PROGNOSTIC EFFICIENCY OF DSM-III IN SCHIZOPHRENIA

A Thesis

Presented to the

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In Partial Fulfillment

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in

Psychology

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ABSTRACT

The DSM-III multi-axial system was examined as a potential predictor of schizophrenic outcome. Subjects hospitalized at a community mental health clinic and diagnosed as schizophrenic according to DSM-III criteria were followed for a two-year period. In addition to their initial DSM-III diagnoses, the following variables were analyzed: 1) basic demographic data, 2) number of rehospitalizations and patient days during the follow-up period, 3) DSM-III diagnosis at the end of the follow-up period, and 4) rating on the Global Assessment Scale at follow-up. Multiple regression analyses revealed that Axis V significantly predicted the number of patient days upon index admission. Other DSM-III variables were not successful in predicting outcome variables. Two measures of social functioning were found to be significant predictors of previous admission history. Individuals who were employed and in a more normalized living arrangement, such as with a spouse, family, or significant other, were less likely to have been admitted recently than were those who were unemployed or lived alone or in an institutional setting. When characteristics of those individuals who were readmitted during the follow-up period were examined, sex and previous admission history

emerged as significant predictors. Males and those admitted more recently to the index admission had a greater number of admissions during the follow-up period. Finally, levels of correlation on Axis II from index admission to follow-up were very low. Several explanations of this result are offered including the difficulty in accurately assessing personality disorder in conjunction with a schizophrenic diagnosis, and the problem of obtaining sufficient data during an acute inpatient admission to make a reliable Axis II diagnosis. In sum, these results suggest that demographic data may be of more value in determining schizophrenic prognosis than DSM-III variables.

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I would like to express my gratitude to Dr. David Lutz for his invaluable assistance and guidance during the course of my work on this thesis. Also of essential importance was the support and patience of my wife, Sandy, and two daughters, Suzanne and Lori. Their encouragement and quiet support were ever present and truly appreciated.

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The Prognostic Efficiency of DSM-III in Schizophrenia

The concept of prognosis has demonstrated its utility in describing the outcome of various disorders. It implies the potentiality for differential outcome that is capable of prediction based on the presence or absence of relevant predictor variables. Such prediction is useful for planning of treatment and for evaluation of treatment effectiveness.

During the past two decades, a considerable body of research has been directed at defining and exploring those variables associated with the prognosis of schizophrenia. Numerous factors have been reported to have an influential impact upon the outcome of schizophrenia. In reviews of this literature, George Vaillant (1962, 1964a, 1964b) identified six factors that were consistently predictive of a good prognosis: 1) history of a blood relative with a psychotic depression, 2) acute onset, 3) confusion or disorientation during the acute episode, 4) absence of a schizoid premorbid personality adjustment, 5) a clear precipitating event, and 6) presence of symptoms suggesting psychotic depression. In a comparison study of recovered schizophrenics and un-

recovered controls (Vaillant, 1962), each of the above factors was significant in discriminating between the two groups. In a subsequent study (Vaillant, 1964), these factors, plus an additional factor, concern with death, comprised a seven-point prognostic scale, and were successful in predicting the clinical course of 82% of 103 schizophrenic admissions.

Examining prognostic variables from a developmental point of view, Harrow, Tucker, and Bromet (1969) found that younger patients tended toward longer hospitalization, whereas married patients were discharged earlier. These results are explained in terms of the acquisition of social skills and external resources which tend to be fewer for the younger, unmarried patient.

Pokorny, Thornby, and Kaplan (1976) identified four variables which correctly classified hospital status (i.e., in hospital vs. not in hospital), for 79% of the examined patients. Out of hospital status, or good prognosis, was associated with 1) shorter previous duration of hospitalization, 2) positive attitudes by relatives toward release, 3) higher ratings for social adequacy, and 4) lower ratings for conceptual disorganization.

In a study of 502 schizophrenics followed between 1967 and 1973, Huber, Gross, Schuttler, and Linz (1980) found pathological as compared to normal personality

type to be significantly related to poor prognosis. Also examined were the presence of precipitating factors and acute onset, both of which were predictive of a favorable prognosis.

In an extension of previous work, Astrup and Noreik (1966) found the following characteristics to be predictive of a more favorable outcome: 1) female, 2) age at onset above forty years, 3) leptosomic body type, 4) non-schizoid pre-psychotic personality, 5) higher intelligence, 6) shorter previous duration of illness, 7) acute onset without prodromal symptoms, and 8) presence of precipitating factors. Factors 2, 4, 6, 7, and 8 were especially discriminative between a favorable and unfavorable prognosis.

Finally, an informative review by Strauss and Carpenter (1979) notes that among these numerous variables, prior length of disorder may be among the most powerful predictors, and they cite premorbid social relations functioning as the most consistent prognostic variable.

This body of research demonstrates that the prognosis of schizophrenia is a reasonable endeavor and that specific variables can be isolated which are predictive of outcome. However, the isolation of individual variables soon leads to the point of diminishing returns as factors of increasingly limited predictive value are discovered. This was recognized at an early

stage within this research area as investigators began to combine significant variables into prognostic scales.

Perhaps the most studied of these instruments are those developed by Wittman (1941, 1944), the Elgin Prognostic Scale with its subsequent revisions by Becker (1955, 1956, 1959), the Kantor, Wallner, and Winder (1953) scale, and the Phillips (1953) scale. These instruments focus on distinguishing subjects along the process-reactive dichotomy which has been considered to be predictive of poor and good prognoses respectively. Nuttall and Solomon (1965) have described the process patient as inadequate within social and sexual interpersonal relationships prior to onset, socially isolated and emotionally unresponsive during childhood and adolescence, and having experienced an insidious onset without precipitating events. In contrast, Wiener (1958) describes the reactive schizophrenic as without significant deficit during the developmental period, having established heterosexual relationships, and having had an acute onset of symptoms, often coincidental with a clear precipitating event.

In a comparison of these three scales, Garfield and Sundland (1966) found some variation in their prognostic efficiency, but also found marital status to be as predictive of length of hospitalization as any of the individual scales. Two explanations of this finding

are offered, stressing either the premorbid personality development or social and environmental factors which differentiate married and unmarried individuals. Emphasizing the personality development, the introverted or schizoid individual is viewed as being less likely to become married, with the opposite being true of the more outgoing, social individual. Therefore, marital status may be indicative of premorbid personality type. With emphasis upon social and environmental factors, the married individual is seen as having developed a responsible role within a family setting, resulting in greater pressure for early hospital discharge.

Nuttall and Solomon's (1965) study of the Becker revision of the Elgin scale and the Phillips scale identified three factors as having the most prognostic significance for prediction of chronicity among schizophrenics: 1) social withdrawl, 2) inadequate heterosexual relationships, and 3) insidious onset.

Beginning with 54 prognostic factors, Stephens, Astrup, and Mangrum (1966) developed an 11-point scale in which the variables differentiated two groups of recovered and deteriorated schizophrenics. Those factors included 1) acute onset, 2) precipitating factors, 3) married, 4) good premorbid history, 5) depression, 6) non-schizoid personality, 7) feelings of guilt, and 8) presence of confusion or disorientation on admission,

which were predictive of a favorable outcome.

These investigations of earlier prognostic scales and the development of the more recent Stephens scale appear to validate the findings of Vaillant (1962, 1964a, 1964b) regarding the importance of a set of core variables that are reflective of the process-reactive dichotomy and are effective in predicting schizophrenic outcome. However, he has suggested in a more recent paper (Vaillant, 1978) that the process-reactive distinction may prove less robust if patients are followed for an extended period, with some reactive schizophrenics becoming eventual process types.

Considerable recent research effort has been focused on the effect of different diagnostic systems on the prediction of outcome. Vaillant (1978) and Stephens (1978) have reported on the confusion that has resulted in the study of prognosis due to the lack of consensus on a definition of schizophrenia. Representative of this research, Kendell, Brockington, and Leff (1979) compared six operational definitions of schizophrenia and their relationship to prognosis: 1) Langfeldt's criteria for distinguishing schizophrenia and schizophreniform psychosis, 2) presence of one or more of Schneider's "symptoms of the first rank," 3) New Haven criteria, 4) "flexible criteria" derived empirically from data from The International Pilot Study of Schizo-

phrenia, 5) Research Diagnostic Criteria of Spitzer, Endicott, and Robins, and 6) a Catego computer program for schizophrenia derived from Present State Examination data. Although each of these operational criteria proved fairly successful in discriminating those patients with a poor outcome, the Spitzer et al (Research Diagnostic Criteria), Carpenter ("flexible criteria"), and Langfeldt criteria were significantly better predictors than the other three.

A more comprehensive means of viewing schizophrenic outcome and its predictors has derived from the work of Strauss and Carpenter (1972, 1974, 1977). In the first of these studies, they have reported on the value of treating outcome not as a single event, but as being comprised of four partially interrelated systems. Their data support the importance of including four factors when measuring outcome: 1) employment functioning, 2) social relations functioning, 3) symptom severity, and 4) duration of hospitalization. Moderate levels of correlation between these factors indicated a degree of relationship, but also suggested their independent contribution to an understanding of outcome. The second study (Strauss and Carpenter, 1974) reported that past employment functioning and social relations functioning each served as the best predictor of its respective outcome. Previous duration of hos-

pitalization proved to be the most effective predictor for all outcome functions. The five-year follow-up study (Strauss and Carpenter, 1977) showed that these predictor-outcome relationships remained stable over an extended period of time.

These findings have led to proposals for a more comprehensive approach to diagnosis. Strauss (1975) suggested that the following factors be tested as part of a comprehensive diagnostic system: 1) symptoms, 2) circumstances associated with symptoms, 3) previous duration and course of symptoms, 4) quality of personal relationships, and 5) level of work function. It is suggested that such an approach would be of more prognostic value than the more conventional diagnostic systems.

With the advent of the Third Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III), which is based in large part on the foregoing and related research, a comprehensive diagnostic system is now being applied to a wide variety of psychiatric populations within varied settings. Its multiaxial approach incorporates many of those factors which have proven to have prognostic significance. Axis I is essentially identical to the previous DSM-II (1968) diagnosis with the addition of a coded classification of course: 1) subchronic, 2) chronic, 3) sub-

chronic with acute exacerbation, 4) chronic with acute exacerbation, and 5) in remission. The prognostic importance of this information is based on past research suggesting the predictive power of previous duration of illness. The diagnosis of Personality Disorders is made on Axis II. As noted in the DSM-III manual (p. 186), the premorbid personality of the schizophrenic often falls into the personality disorder categories of Paranoid, Schizoid, Schizotypal, or Borderline. The prognostic significance of the premorbid schizoid personality disorder has already been noted. Since by definition, a personality disorder has its inception during childhood or adolescence, it will likely precede the onset of schizophrenia and may be indicative of an insidious as opposed to an acute onset. Axis III is for the inclusion of Physical Disorders or Conditions. No definitive research has been conducted on the influence of physical disorders on schizophrenic outcome. Axis IV provides for coding of Psychosocial Stressors. Considerable research, (Birley and Brown, 1970; Brown and Birley, 1970; Beck and Worthen, 1972; Beck, 1978; Jacobs and Meyers, 1976; and Harder, Strauss, Kokes, Ritzler, and Gift, 1980) has indicated that the influence of precipitating events on initial onset and rehospitalization of schizophrenics is significant. The final axis in the DSM-III system is for coding

Highest Level of Adaptive Functioning Past Year. This category is a composite of three major areas: 1) social relations, 2) occupational functioning, and 3) use of leisure time. This composite factor is of prognostic value since the level of functioning of a patient often returns to premorbid levels. Also, as reported by Strauss and Carpenter (1972, 1974, 1977), social relations and employment functioning serve as powerful predictors of their respective outcome functions.

Therefore, the DSM-III diagnostic system can be viewed not only as a means of describing a psychiatric condition, but also as a tool for determining prognosis. To date, no study has addressed this issue, likely due to the relative recency of DSM-III. Examining the specific case of schizophrenia, the current study examined the efficacy of DSM-III for predicting outcome, testing the following hypotheses: 1) The multi-axial diagnosis would more effectively predict outcome than an Axis I diagnosis alone, 2) The following factors would be predictive of a poor outcome as measured by the dependent variables: a) presence of a chronic as opposed to a subchronic course, (Axis I), b) presence of a personality disorder, with a schizoid personality disorder predicting the poorest outcome, (Axis II), c) lower levels of psychosocial stressors, (Axis IV), and d) lower levels of Highest Level of Adaptive

Function Past Year, (Axis V).

Method

Subjects

The subjects for this study were one hundred sixty (160) patients diagnosed as schizophrenic according to DSM-III criteria and admitted consecutively to the San Bernardino County Department of Mental Health psychiatric inpatient unit, commencing with admissions as of July 1, 1980. This is an acute community psychiatric inpatient facility with primary objectives of short-term stabilization and return to the community, or transfer to State hospitalization for longer term care. Additional criteria for inclusion consisted of the following: 1) absence of a substance addiction or organic brain dysfunction based on the DSM-III diagnosis and psychiatric history, and 2) ages between 18 and 60.

Independent Variables

Independent variables examined were the five axes of the DSM-III diagnosis and the following demographic variables: 1) age, 2) sex, 3) ethnic identity, 4) education, 5) marital status, 6) legal status, 7) living arrangement, and 8) employment status. Also examined was psychiatric history: 1) first time admission, or 2) readmission.

Dependent Variables

The subjects were followed for a two-year period following their index admission during which time the number of rehospitalizations and number of patient days were recorded. At the end of the two-year follow-up period, the subjects' outpatient records were examined and the current DSM-III diagnosis was recorded. As an indication of social and employment functioning, and of symptom severity, the subjects' scores on the Global Assessment Scale (Endicott, Spitzer, Fleiss, and Cohen, 1976) was also collected.

Results

The sample was comprised of 160 subjects with a DSM-III Axis I diagnosis of schizophrenia. They ranged in age from 18 to 60 years with a mean age of 32.54 years. Subjects were divided by sex as follows: 61.9% males, 38.1% females. A majority, 59.4% were Caucasian, 23.8% Black, 15.6% Spanish Surname, and 1.2% other. Subjects having never married accounted for 51.3%, with 15.6% married, 3.7% widowed, 28.7% dissolved or separated, and 0.6% not available.

Subjects living alone accounted for 15.0% of the sample, 58.7% resided with others, 20.0% were in placement, and 3.7% had no stable arrangement. A large majority of subjects, 91.2% were hospitalized

on an involuntary basis, the remaining 8.8% representing voluntary admissions.

The educational level of subjects ranged from eighth grade or less, 9.4%; grades 9-12, 20.0%; high school graduates, 31.3%; some college, 19.4%; to BA or above, 3.1%. This data was not available for 16.9% of cases. The large majority of subjects, 91.2% were unemployed, with 5.6% being employed either full or part-time. This data was not available for five cases.

Previous psychiatric history and DSM-III diagnostic information upon index admission are presented in Tables 1-8 (see Tables 1-8). Table 1 presents the previous psychiatric history of subjects according to the presence of previous psychiatric inpatient admissions. As can be seen, the large majority of subjects had been previously hospitalized, indicating the high level of chronicity among this sample.

Table 2 presents a breakdown of subjects according to Type of Schizophrenia taken from Axis I at the time of the initial admission. The majority of cases fell within two categories, Undifferentiated and Paranoid. The remaining categories accounted for only 5.0% of the entire sample.

Table 3 presents the Course of Disorder as coded in the fifth digit of Axis I. The majority of cases fell into the chronic categories which was previously

Table 1

Number of Previous Psychiatric Inpatient Admissions

Category	Number of patients	Percentage
Within last 12 months	81	50.6%
Prior to last 12 months	66	41.3%
No previous admissions	13	8.1%

Table 2

Number of Patients by Type of Schizophrenia (Axis I)

Type of Schizophrenia	Number of patients	Percentage
Disorganized	2	1.2%
Catatonic	2	1.2%
Paranoid	63	39.4%
Undifferentiated	89	55.6%
Residual	4	2.5%

Table 3

Number of Patients by Course of Disorder (Axis I)

Course of Disorder	Number of patients	Percentage
Subchronic	1	0.6%
Chronic	28	17.5%
Subchronic with acute exacerbation	5	3.1%
Chronic with acute exacerbation	116	72.5%
In Remission	9	5.6%
Not Available	1	0.6%

Table 4

Number of Patients with Diagnosed Personality Disorders (Axis II)

Personality Disorder	Number of patients	Percentage
Yes	37	23.1%
No	109	68.1%
Not Available	14	8.8%

Table 5

Number of Patients by Type of Personality Disorder (Axis II)

Type of Disorder	Number of patients	Percentage
Schizoid	12	7.5%
Paranoid	6	3.7%
Schizotypal	2	1.2%
Borderline	2	1.2%
Histrionic	1	0.6%
Antisocial	5	3.1%
Avoidant	1	0.6%
Dependent	3	1.9%
Atypical, Mixed, Other	5	3.1%
None	109	68.1%
Not Available	14	8.8%

Table 6

Number of Patients with Diagnosed Physical Disorders (Axis III)

Physical Disorder	Number of patients	Percentage
Yes	21	13.1%
No	136	85.0%
Not Available	3	1.9%

Table 7

Number of Patients by Level of Psychosocial Stressors (Axis IV)

Level	Number of patients	Percentage
None	11	6.9%
Minimal	63	39.4%
Mild	18	11.2%
Moderate	24	15.0%
Severe	13	8.1%
Extreme	3	1.9%
Not Available	28	17.4%

Table 8

Number of Patients by Level of Adaptive Functioning (Axis V)

Level	Number of patients	Percentage
Good	3	1.9%
Fair	28	17.5%
Poor	63	39.4%
Very Poor	49	30.6%
Grossly Impaired	13	8.1%
Not Available	4	2.4%

noted in Table 1 regarding the number of previous inpatient admissions.

Data from Axis II, Personality Disorders are presented in Tables 4 and 5. Table 4 presents the number of subjects diagnosed with a personality disorder. Table 5 provides a breakdown of the number of subjects diagnosed with each disorder. Those disorders most likely to precede a schizophrenic condition, categories 1-4 accounted for 13.6% of the sample with the largest percentage diagnosed as schizoid, 7.5%. However, the majority of subjects, 68.1% had no diagnosed condition on Axis II.

Table 6 presents the number of subjects with diagnosed Physical Disorders as recorded on Axis III. The majority of subjects had no diagnosed condition.

Tables 7 and 8 contain data from Axis IV, Level of Psychosocial Stressors, and Axis V, Level of Adaptive Functioning Past Year, respectively. The largest number of subjects were rated as having experienced only minimal levels of pre-admission stress. Other levels were fairly evenly distributed. Table 8 shows that more subjects tended to be rated at the lower levels of Adaptive Functioning with 70.0% of subjects falling into the Poor and Very Poor categories.

Description of Analyses

To determine whether the DSM-III axes were pre-

dictive of the dependent variables, hierarchal stepwise regression analyses were conducted, (see Table 9). Dependent variables examined were 1) number of admissions previous to the index admission, 2) length of stay upon index admission, 3) number of rehospitalizations and patient days during the two-year follow-up period, and 4) subjects' scores on the Global Assessment Scale at follow-up as an indication of social and employment functioning and of symptom severity.

With number of patient days upon index admission as the dependent variable, a significant multiple correlation was found, R^2 (2, 119) = .08, $p < .05$. Type of schizophrenia, $F(1, 119) = 2.95$, $p = .09$, was included first in the analysis and approached significance. This indicated that undifferentiated schizophrenics were more likely to remain in the hospital longer upon initial admission than were paranoid and other types of schizophrenics. Axis 5 was found to be a significant predictor, $F(1, 119) = 7.72$, $p < .006$, indicating that schizophrenics with lower levels of adaptive functioning had longer initial hospital stays than those with higher levels of adaptive functioning. Other dependent variables were not significantly predicted.

In order to see whether demographic and social functioning variables were more predictive of outcome

Table 9

Significant Multiple Regression Analyses and Reliable Predictor Variables

Dependent Measure	Significant Predictors	Direction of Predictor
Number of patient days (Index Admission)	R^2 = .08*	
	Axis V	lower levels > higher levels
	$F(1, 119)$ = 7.72	
	p = .006	
Number of previous admissions	R^2 = .29**	
	Employment	employed < unemployed
	$F(1, 92)$ = 22.15	
	p < .001	
	Living Arrangement	living with spouse, family, of significant other < living alone or in institutional setting
	$F(1, 92)$ = 8.30	
	p < .005	

Table 9 (continued)

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*$p < .05$

**$p < .01$

variables than DSM-III predictors, hierarchal stepwise regressions were conducted over the dependent variables used in the previous analyses. Basic demographics, including age, sex, marital status, race, and education, comprised the first set of predictor variables. These were followed by two measures of social functioning, employment status and living arrangement, whether alone or with others. Finally, the predictor variables from DSM-III were included, with Type of Schizophrenia, followed by Course, Personality Disorder, Axis 3, Axis 4, and Axis 5. Within sets, variables were entered in a stepwise manner.

Number of readmissions and number of patient days upon readmission were not predicted significantly. However, when previous admissions was used as the dependent variable, two measures of social functioning were found to be significant, $\underline{R}^2$ (8, 92) = .29, $\underline{p} < .01$. First, was employment, $\underline{F}(1, 92) = 22.15$, $\underline{p} < .001$, indicating that individuals who were employed were less likely to have been admitted within the previous 12 months than were those who were not employed. Secondly, was living arrangement, $\underline{F}(1, 92) = 8.30$, $\underline{p} < .005$, indicating that individuals who were living in a more normalized social situation, such as with a spouse, family, or significant other, were less likely to have been admitted recently than were those who lived

alone or in an institutional setting. One other predictor which approached significance was sex, $F(1, 92) = 3.31$, $p = .07$, indicating that females were less likely to have been admitted recently than were males.

To examine those characteristics of individuals who were readmitted during the follow-up period, stepwise hierarchal regressions were conducted using number of readmissions and number of patient days upon readmission as dependent variables. The demographic variables described previously were included first in the regression, followed by employment status and living arrangement, which were followed by number of previous admissions and whether an acute exacerbation had accompanied the episode. For number of readmissions, a significant equation was revealed, R^2 $(10, 65) = .30$, $p < .01$, with three important predictors indicated. First, was sex, $F(1, 65) = 10.39$, $p < .002$, indicating that males had more readmissions than did females. Secondly, was previous admissions, $F(1, 65) = 6.91$, $p < .01$, indicating that those individuals who had been admitted more recently had a greater number of admissions during the follow-up period. Finally, marital status approached significance, $F(1, 65) = 2.98$, $p = .089$, as those individuals who had been married had fewer readmissions than those who had not been married.

The Global Assessment Scale was found to be significantly correlated with employment, r = .3192, N = 56, p < .016, and with preadmission history, r = .3529, N = 56, p < .008. These results indicate that higher ratings on the GAS scale were associated with those subjects who were employed and were hospitalized less frequently prior to the index admission.

In order to examine the relationships among the various axes, correlations among all DSM-III variables, both at index admission and at follow-up were calculated, (see Table 10). First, the correlation between Type of Schizophrenia upon index admission and at follow-up was r = .5733, N = 87, p < .001. This suggests a fairly reliable and stable diagnosis over a two year period. Correlations among Personality Disorders on Axis II, considered to be generally stable over time, revealed a less reliable relationship. The correlation between Personality Disorder upon index admission and at follow-up, a dichotomous variable (yes, no), was r = .0556, N = 70, p = .647. A similar degree of relationship was found between Personality Disorder type at index admission and at follow-up, r = .0612, N = 70, p = .615. Axes 4 and 5 were negatively correlated, r = -.3189, N = 132, p < .001, indicating that individuals with lower levels of psychosocial stress upon index admission tended to be

Table 10

Correlations of DSM-III Variables (Index Admission)

	Variable						
Variable	TypSchiz	Course	PerDis	PerTyp	A3	A4	A5
TypSchiz	---						
Course	.0080 N=159	---					
PerDis	.0083 N=146	.2226 N=145	---				
PerTyp	.0367 N=146	.1287 N=145	.8771 N=146	---			
A3	-.0036 N=157	.1406 N=156	-.0849 N=146	-.0793 N=146	---		
A4	-.0174 N=132	-.2729 N=131	-.2141 N=123	-.1720 N=123	.0258 N=132	---	
A5	-.0443 N=156	.1022 N=155	.0080 N=145	-.0083 N=145	-.0326 N=155	-.3189 N=132	---

Table 10 (continued)

Correlations of DSM-III Variables (Index and Follow-Up)

	Variable						
Variable	TypSchiz	Course	PerDis	PerTyp	A3	A4	A5
TypFol	.5733 N=87	-.1390 N=86	-.1016 N=79	-.0685 N=79	.1434 N=84	-.0760 N=72	-.1098 N=85
CoursFol	.0840 N=84	.1079 N=84	.1872 N=77	.1410 N=77	-.0983 N=81	-.2674 N=69	.0204 N=82
PerFol	.0462 N=78	-.0249 N=78	.0556 N=70	.0223 N=70	.0000 N=75	-.1350 N=63	-.0604 N=76
PTypFol	.1429 N=78	-.0628 N=78	-.0212 N=70	.0612 N=70	.0608 N=75	-.1083 N=63	-.1287 N=76
A3Fol	-.1044 N=86	.1691 N=85	.0354 N=77	.0298 N=77	.2762 N=83	.0025 N=72	.0275 N=84
A4Fol	.0386 N=64	.1100 N=64	.0298 N=58	-.0965 N=58	-.1952 N=62	.2667 N=58	-.2750 N=63
A5Fol	.0447 N=86	-.1264 N=85	-.0015 N=78	-.0271 N=78	.1196 N=84	-.2403 N=72	.0090 N=85

Table 10 (continued)

Correlations of DSM-III Variables (Follow-Up)

	Variable						
Variable	TypFol	CoursFol	PerFol	PTypFol	A3Fol	A4Fol	A5Fol
TypFol	---						
CoursFol	-.1434 N=84	---					
PerFol	.1013 N=75	.0994 N=74	---				
PTypFol	.1656 N=75	.0710 N=74	.8348 N=78	---			
A3Fol	-.0544 N=84	-.1396 N=81	.0659 N=74	-.0231 N=74	---		
A4Fol	-.1462 N=63	.1032 N=61	.1585 N=56	.1916 N=56	-.0140 N=62	---	
A5Fol	.2410 N=83	.0040 N=80	-.0449 N=75	-.0058 N=75	.0109 N=83	-.2151 N=64	---

Table 10 (continued)

NOTE: Abbreviations for variables: TypSchiz = Type of Schizophrenia; Course = Course of Disorder on Axis I; PerDis = Presence of absence of Axis II diagnosis; PerTyp = Type of Axis II diagnosis; A3 = Axis III; A4 = Axis IV; A5 = Axis V; TypFol = Type of Schizophrenia at follow-up; CoursFol = Course at follow-up; PerFol = Presence or absence of Axis II diagnosis at follow-up; PTypFol = Type of Axis II diagnosis at follow-up; A3Fol = Axis III at follow-up; A4Fol = Axis IV at follow-up; A5Fol = Axis V at follow-up.

diagnosed at more regressed levels of adaptive functioning.

Discussion

As previously outlined, the DSM-III diagnostic system appears to contain a set of basic elements which have been previously reported to have prognostic capability in the prediction of schizophrenic outcome. However, in the present study, the DSM-III multi-axial system proved to be generally ineffective as a predictive instrument. Axis 5 significantly predicted number of patient days upon index admission. Type of Schizophrenia (Axis I), which offers no new contribution beyond DSM-II, approached significance on this variable. Other dependent variables were not significantly predicted by the other DSM-III predictor variables.

Therefore, both major hypotheses failed to be substantiated. Rather, demographic and social functioning variables demonstrated consistently better predictive power than did DSM-III. This is not altogether surprising as the prognostic importance of demographic and social variables has been well documented (Nuttall and Solomon, 1965; Garfield and Sundland, 1966; Harrow et al, 1969; Strauss and Carpenter, 1972, 1974, 1977).

It is further noted that those variables successfully predicted for the entire sample were index admission variables (number of patient days; number of previous admissions). Dependent measures collected during the follow-up period (number of readmissions; number of patient days upon readmission; GAS scores), were not successfully predicted for the entire sample. Upon examining the characteristics of those readmitted during the follow-up period, number of readmissions was successfully predicted by sex and previous admission history, with marital status approaching significance.

Several factors may explain these results, in particular, the relatively ineffective predictive power of DSM-III variables as compared to demographic and social functioning variables. First, this study was conducted in an in vivo clinical setting with diagnoses being made by different clinicians at index admission and at follow-up, and without the advantage of rater-reliability methodology. While losing the benefit of more accurate experimental control, it provided a realistic look at how DSM-III is being utilized clinically within a community mental health setting.

The correlation of Type of Schizophrenia from

index admission to follow-up was substantial, $\underline{r}$ = .5733. However, correlations on Axis II from index admission to follow-up, as noted earlier, were quite low. This suggests the likelihood of inaccurate diagnoses since personality disorder is considered to be a generally stable condition over time.

The problem of obtaining reliable results for the diagnosis of personality disorders has been previously reported (Walton, et al, 1973; Tyrer, et al, 1979). A recent study (Mellsop et al, 1982) which examined the reliability of Axis II of DSM-III utilizing levels of agreement among three psychiatrists for 74 patients, produced a lower kappa coefficient ($\underline{k}$ = .41) than that observed in the DSM-III field trials ($\underline{k}$ = .54). However, this study excluded patients with schizophrenic diagnoses. The present study appears to indicate that reliability is even further weakened when a personality disorder is made in conjunction with a schizophrenic diagnosis. The distinction between symptomatology indicative of schizophrenia and of personality disorder is sometimes a difficult one, and the reliability of the less prominent disorder (usually the personality disorder), is likely to be adversely affected.

An important distinction between the Mellsop

study and the current study is the number of clinicians utilized and the period of time over which reliability was measured. The Mellsop study utilized three psychiatrists who examined patients over three consecutive days, whereas the current study used multiple clinicians, comparing inpatient and outpatient diagnoses over a period of two years. This protocol produced near zero levels of correlation on Axis II. Once again, it is possible that presenting symptomatology could be a critical factor. Acute schizophrenic symptoms are likely to overshadow the less prominent underlying personality disorder during an acute inpatient admission. The dysfunctional personality may be more apparent and more likely to be accurately assessed during a less acute phase of the schizophrenic condition. Although the current study did not specifically address this issue, it is suggested that future studies should examine whether an Axis II diagnosis, made in conjunction with an Axis I schizophrenic diagnosis is more reliably made during a less acute phase of the schizophrenic condition (i.e., outpatient vs. inpatient setting).

Another difficulty with making an Axis II diagnosis during an acute inpatient admission is with the collection of verifiable data to support the diagnosis. Since, by definition, personality disorders

have their inception during childhood or adolescence, such a diagnosis is not warranted on the basis of current symptomatology alone, but must include verifiable information which indicates that the current symptoms have also been active during the patient's developmental period. However, such information, which is most reliably obtained from family members, is often unavailable during a short inpatient admission. This leaves the clinician with the options of either deferring the diagnosis, or making a clinical guess which is based on incomplete information. Such diagnoses made without a complete data base could obviously lead to poor reliability results.

A final factor, potentially responsible in part for the low reliability obtained on Axis II was the level of training in the use of DSM-III received by the contributing clinicians. This study utilized the first DSM-III data collected by this community mental health clinic. Prior training in the use of DSM-III consisted of two consecutive one-day sessions which focused on 1) use of the multi-axial system, 2) distinctions between DSM-II and DSM-III, 3) changes in criteria for schizophrenia, 4) presentation of sample cases, and 5) use of the decision trees for differential diagnosis. Criteria for specific diagnostic categories other than schizophrenia were not

emphasized. It is suggested that whereas clinicians were familiar with the diagnosis of schizophrenia utilizing DSM-II, that the new protocol of DSM-III requiring the routine diagnosis of personality disorders on Axis II was a less familiar task.

A recent study (Webb et al, 1981) examined the effectiveness of a 2½-day training program on the accuracy of DSM-III diagnoses. Five sample vignettes presenting the following diagnostic categories were utilized: 1) Major depression, 2) Borderline personality disorder, 3) Childhood onset, pervasive developmental disorder, 4) Schizophrenia, paranoid type, and 5) Primary degenerative dementia, presenile onset. The borderline personality disorder, the only diagnosis representative of Axis II, yielded the lowest level of agreement among the 146 respondents (56.2%). Considering this and previously noted studies, it appears to be consistently documented that personality disorders present significant problems in obtaining reliable diagnostic results.

In order to maximize levels of reliability, particularly for Axis II, it is recommended that training programs emphasize the necessary criteria for personality disorder diagnoses and that aids such as diagnostic checklists containing basic criteria and reminders to examine developmental data

be included. In addition, follow-up training sessions which provide for continued sample case diagnosis and comparative analysis and de-briefing among clinicians may prove useful in clarifying those areas which make this type of assessment seemingly more difficult. The use of videotapes of actual assessment sessions may prove useful as training tools in which clinicians can not only compare diagnostic capabilities, but develop interviewing and data collection strategies that are useful in obtaining the most relevant clinical data. As more extensive training methods are developed, it is expected that the reliability of Axis II will improve.

This study utilized rehospitalization rates and number of patient days which have limited utility as dependent variables in prognosis research as they are confounded with other variables which are unrelated to level of pathology. Further research, as suggested by Strauss and Carpenter (1972, 1974, 1977), should include the use of employment and social relations functioning measures. The present study utilized the Global Assessment Scale as an approximation of these variables, but due to insufficient data, this measure was not included in the regression analyses. However, its correlation with employment and preadmission history suggests it may

be useful in further investigations.

Finally, the negative correlation between axes IV and V lend support for the internal validity of these two measures. This result indicates that those individuals who were diagnosed with lower levels of psychosocial stressors tended to be rated at lower levels of adaptive functioning. This supports the well documented finding that individuals who have experienced minimal precipitating events tend toward the more debilitating process schizophrenia. Conversely, those individuals who were diagnosed with higher levels of psychosocial stressors upon index admission were rated at higher levels of adaptive functioning. Future studies should examine the ability of these two variables to predict employment and social relations functioning.

In sum, these preliminary results suggest that the DSM-III system may not be a great improvement over DSM-II with schizophrenics in a community mental health setting. Mental health workers continue to diagnose most schizophrenics as undifferentiated (56% in this sample), yielding little of the differentiation that was hoped for from DSM-III. When the DSM-III axes were used as predictor variables, they were useful only in predicting number of patient days upon index admission. As in previous

studies, demographic and social functioning variables, such as employment status and living arrangement, appear to be much more useful in predicting outcome. This initial exploratory investigation suggests that researchers will need to develop more precise dependent measures along with greater reliability of the DSM-III system if it is to be useful as a prognostic tool in a clinical setting.

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